# Chapter 2
# The *Ghayls* of Ṣan'ā'

Ṣan'ā' lies in a plain (Ḥaql Ṣan'ā') at the foot of and to the west of a high mountain chain formed by Jabal Nuqum, Birāsh and the massif of Jabal al-Lawz. The old city at the foot of Nuqum is built on ground sloping gently towards the west till it reaches the level of the banks of the Sā'ilah, the wadi-bed running northwards and separating it from the Quarter of Bustān al-Sulṭān, established in the Middle Ages.

The water supply of these two districts of the city was always mainly drawn from wells, dug to an average depth of some 35 m in recent decades. Only over the last few years has their average depth touched 50 m, and below this level the water table seems to dry up altogether. As al-Rāzī[1] puts it, 'In every dwelling was a well or two, and a garden (*bustān*) in which there were various kinds of fragrant herbs (*rayāḥīn*).' Up to the present day, wells are also used for irrigation to some extent, whereas the traditional way of irrigating non-rain crops is by means of cisterns or rivulets (*ghayls*) which convey to the fields water that is collected by drawing on a complex of wells. These are generally situated at the foot of hills and near high mountains.

A *ghayl*, properly speaking, means simply a running stream—of which there are numbers in south west Arabia flowing on the surface of the ground, but in the more technical colloquial usage of Ṣan'ā' and other Yemenite towns the *ghayl* is an artificial often partly subterranean water-channel like the Iranian *qanāt* or *kārīz* and Omani *falaj*. The *ghayl* is constructed with pits or wells excavated at intervals which can be used to help maintain the channel clear of debris. It conveys water considerable distances from its source to supply the town, and for this reason there is a small corpus of proverbs such as, *Ghayl sarrāḥ wa-jū' faḍḍāḥ*, A stream flowing forth, but hunger brings shame'[2] and *'Ghayl Bayt Na'am yisqī li-ghayr ahl-ah*, The stream of Bayt Na'am[3] irrigates/waters other than its own people.' This diversion of the use of local waters to supply a remoter place appears to have been a cause of popular resentment to countryfolk who suffered thereby, and it may be that only a powerful ruler could impose on them in this way, and the excavation of the *ghayl* would moreover involve much expense which it would require ample revenues to meet.

A more technical term in connection with the *ghayl* is the Arabic word *kidāmah/kiẓāmah*, pit, shaft, the latter form figuring in a Tradition which indicates that the *kiẓāmah* was known to the Hijaz in pre-Islamic times.[4] *Kidāmah* is used in the speech of the local people around Ṣan'ā' both at Ghayl al-Barmakī and al-Aswad.

The *ghayl* is also known at Ghayl Bā Wazīr near the Ḥaḍramī coast where however it is called *mi'yān*. The question as to whether this type of underground channel irrigation was introduced into the Arabian Peninsula from Persia, as is often all too readily assumed, remains open. It would of course be a facilely attractive theory to suppose that the *ghayl* system was introduced to Ṣan'ā' by the Persian Abnā' before Islam, and spread to other Yemeni towns where we have found them, but though Arab historians do sometimes associate irrigation works with the Persians there is no other evidence, as yet, forthcoming to prove their assertions.

The channels generally run for a while underground then emerge into the open—apparently they do not run underground to prevent evaporation, but to drain any waters infiltrating through the sub-soil to them. Below the actual catchment area there is generally a large cistern that ensures a steady flow and continuity of the supply. The channel then runs, open to the sky, following the best route, sometimes zigzagging to prolong the length of the water-course and thus find a more gentle gradient—where otherwise the slope of the land would create too great a speed of the flow. The majority of the channels are intended for irrigation alone—only al-Aswad, in active use until 1973, was employed for drinking and religious ablutions.

The Yemen has many channels for drinking and ablutions only—for example the channel conducting the water to the celebrated mosque of al-Janad, supposedly of the Companion of the Prophet, Mu'ādh b. Jabal,[5] near Ta'izz. This channel

1 Aḥmad 'Abdullāh al-Rāzī, *Tārikh madīnat Ṣan'ā'*, ed. Ḥusayn b. 'Abdullāh al-'Amrī and 'Abd al-Jabbār Zakkār, Damascus, 1974, 96.

2 Qāḍī Ismā'īl's unpublished proverbs. It is also quoted in E. Rossi, 'Note sull' irrigazione, l'agricoltura e le stagioni nel Yemen', *Oriente Moderno*, Roma, 1953, XXXIII, 357, *jū' faḍḍāḥ* being explained as—*la fame fa commettere azioni vergognose*. This is a most valuable article on the Yemen in the thirties.

3 Goitein, *Jemenica*, 112, no. 799. Bayt Na'am is a Hamdān village at the top of Wādī Ḍahr. Wādī Ḍahr is however a perennial surface stream, not a subterranean water-course, so in this case at least it simply means that people at the source of a spring obtain no advantage from it.

4 Cf. R. B. Serjeant, 'Some irrigation systems in Ḥaḍramawt', *BSOAS*, London, 1964, XXVII, i, 57. Abū 'Ubayd al-Qāsim b. Sallām al-Harawī, *K. al-Ajnās*, Bombay, 1938, defines *kiẓāmah* as 'wells/pits (*ābār*) which are excavated, there being a distance between them. Then a bore is made (*yukhraq*) between each two wells with a channel (*qanāt*) which leads the water from the first to that which is next to it, until the water is collected in the last of them.' See Ḥusayn b. Fayḍ Allāh al-Hamdānī, *al-Ṣulayḥiyyūn*, Cairo, 1955, 152, for al-Kaẓā'im, near Zabīd. Ibn al-Dayba', *Qurrat al-'uyūn*, ed. Muḥammad al-Akwa', Cairo, 1977, II, 111, under annals for 791/1389, speaks of roofed water channels *makhālīl* (sing. *makhlūlah*) (*masqūfah*) of Zabīd, the term still being in current use. For Iran and Oman see Professor A.K.S. Lambton, art. 'Kanāt' in *E.I*[2].

5 The thin rough-hewn stone pillar in the midst of the court of the mosque is known as 'Aṣā Mu'ādh, i.e. Mu'ādh's staff.

commences at the hills, 7km to the north of al-Janad where many catchment wells are to be found. It then runs underground at a depth averaging 3.5m, for a distance of between 200 to 300m without small wells for giving access to cleaning the water-course, and then with small wells for this purpose for another 100m—rather like the North African *foggarah* system. From this point the channel runs in the open for a total length of 15 km. Originally it supplied drinking water to 22 villages, ending at the mosque of al-Janad itself.

Two groups of channels are found in the Ṣan'ā' area—one on the northern, and the other on the southern side of the city. This latter waters the fields on the southern side of Ṣan'ā' in the area known anciently and today as al-Ṣāfiyah, and supplies the town itself—whereas the former brings water to the near-by town of al-Rawḍah to the north.

Only the southern group of channels directly concerns the city of Ṣan'ā', but we must take into consideration also the northern channels which collect the water in the suburban area of Sha'ūb/Shu'ūb[6] to conduct it to this important satellite town of Ṣan'ā' which is mainly owned, like the Wādī Ḍahr, by the great families of the capital. It incidentally produces a relevant quantity of the grapes and vegetables sold in the Ṣan'ā' Market. This southern group of *ghayls* consists of Ghayl Ālāf, al-Ghayl al-Aswad, Ghayl al-Barmakī, and Ghayl al-Bāsh, the last-named located, more precisely, to the south east of Ṣan'ā'.

There is one indication that Ṣan'ā' or its environs were served by a *ghayl* before Islam, though the evidence is somewhat slender. Al-Rāzī[7] cites a statement that the Ṣāfiyah of Ṣan'ā' is Daynubādh[8] and Ghayl 'Alīb/'Ulayb. In August 1975, while re-examining part of the old course of Ghayl al-Barmakī we asked Sinḥān tribesmen about this Ghayl 'Alīb, a name which they did not know in this form, but they pointed to a line of trees some distance to the north of al-Barmakī, nearer to Nuqum which they knew as the village of 'Alab.[9] This village, they said, had *aghyāl* from the time of Ḥimyar, but they had been from remote ages buried over (*madfūn*). On a visit, shortly after this, to 'Alab we found, but did not have time to do more than look briefly at them, fairly deep wells which the villagers told us had in one case at least, probably more, two underground channels leading into them from a mainly easterly direction, and cut in rock. These were called by them *majallah* with the curious plural *jīlān*. The village had quite extensive walled orchards, or what had been orchards, and there were abundant evidences of a well-devised surface irrigation system which gave the impression of antiquity. Only a careful examination of the ground may confirm that there was actually an ancient *ghayl* feeding Ṣan'ā' or the fields about it. Al-Rāzī[10] however has some further information to quote. 'The most lawful of the Ṣawāfī are what 'Umar b. al-Khaṭṭāb (the second Caliph) appropriated (*aṣfā-hu*) of the land of Bādhān (the Persian Abnā' Governor of Ṣan'ā'), of which are 'Alīb (read 'Alab) and a property (*ḍay'ah*) in al-Manshar,[11] and the Market of Bādhān.'[12] Elsewhere he states, 'Bādhān had no Muslim son so 'Umar made his property a *ṣāfiyah*.' Then, again, he[13] describes the place Maṣra' al-Nūbah/Nawbah as—a place under Ghumdān towards the road of 'Alīb (read 'Alab).

The first record of the construction of a *ghayl* is that attributed to Muḥammad b. Khālid al-Barmakī of the famous Barmecide house and of Persian descent, sent to Ṣan'ā' as 'Abbāsid Governor

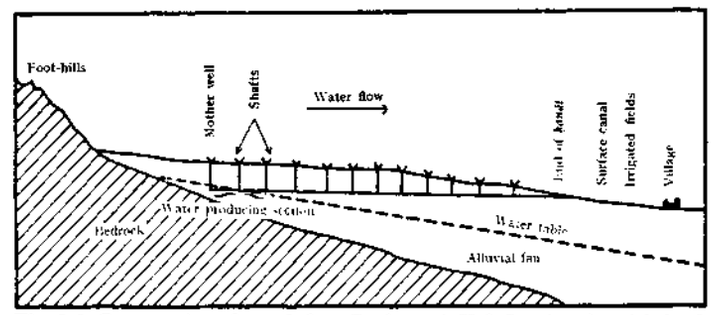



**Fig. 2.1** Cross section of a *qanāt* from Professor A.K.S. Lambton's article *ḳanāt* (*EI*²). The *ghayls* of Ṣan'ā' and other Yemeni towns do not follow the pattern of distribution in the diagram as they run through the town underground before emerging north of it, but the principle seems identical. (Courtesy of Professor Lambton and the *Encyclopaedia of Islam*)

in 183/799[14]. In Ṣan'ā' he built Dār al-Barāmikah, later known as Dār al-Ḍarb—the Mint, in the place known as Sūq al-Tabbānīn, the Straw-sellers' Market. A suitable location for this building would be near the apparently artificial mound upon which stands the present-day Sūq al-'Arj where fodder is sold, and which, at that period, may have been on the edge of the city—its other name, al-Jabbānah, implies an open space outside the walls, though of course today it is well within the centre of the city.

The Banū Shihāb, says al-Hamdānī,[15]

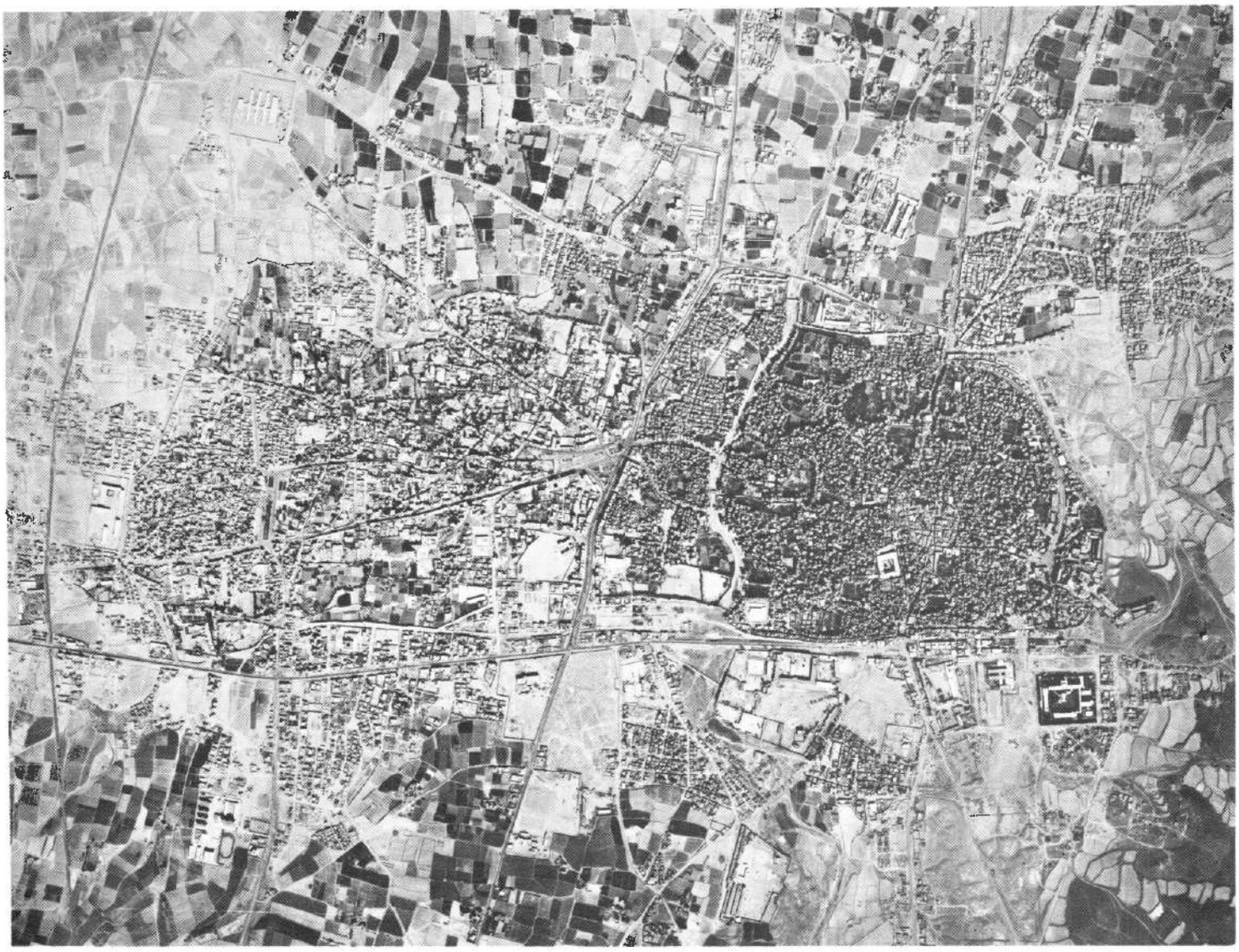
> have most of Ḥaql Ṣan'ā', a part of which is the Maydān of 'Abbād b. al-Ghamr. When Ibn Barmak excavated the great river (*nahr* = *ghayl*) the places in which his (mattocks) were to strike and his ditches (? *fasātīj*[16] perhaps from Latin *fossatum*) lay in the land of 'Abbād b. al-Ghamr. So he asked him to sell the passage-way (*manfidh*) of the Ghayl, but he refused, saying, 'Such as I does not sell a middle part of his land. Yet it does not become me to stand in the way of any path to (public) weal (*sabīl-an min subul al-khayr*), but, conditional on your alloting me a share in your benefaction (*makrumah*), I shall make room for you.' He (Ibn al-Barmakī) replied, 'Say what is necessary.' To which he replied, 'A branch channel (*shagharah*, pl. *-āt*)[17] which I shall make a water conduit (*mashra'*) for the inhabitants of Ṣan'ā'.' So from it he cut off for himself the *shagharah*-channel which pours into Siqāyat 'Abbād—which today is the drinking place (*mashrab*) of the people of Ṣan'ā'. Ṣan'ā' people used to reckon that Ibn Barmak's benefaction was rendered complete only by 'Abbād since he took charge of most of it for them to drink and for the irrigation of their lands (*ḍiyā'*).

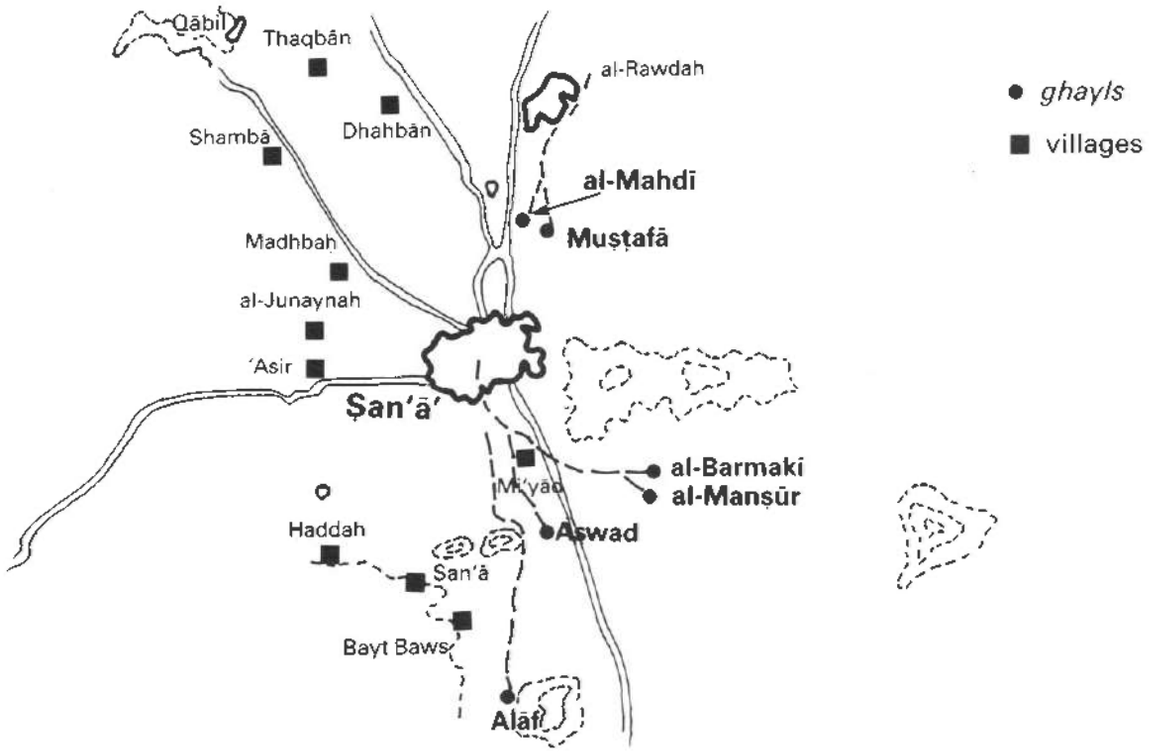
In the rather confused passage following, al-Hamdānī seems to indicate that the Ghamriyyūn are one of the Arab families of Banū Shihāb in Ṣan'ā' and have a *ghayl rādi'*[18] which comes out from the middle of Ṣan'ā' (*makhraju-hu min wasaṭ Ṣan'ā'*). Whether this is to be identified with Ghayl al-Barmakī or is a separate water-course is not known.

As a working hypothesis it is suggested that 'Abbād's Maydān lay somewhere about the present-day Bāb al-Yaman. Aḥmad al-Shāmī states that in his youth, while foundations for a house south of the Jāmi' Mosque were being excavated a *ghayl* was discovered—might this be al-Barmakī? It may have run through the area west of the Jāmi' to the long open street between al-Ṭawāshī and al-Filayḥī Quarters and out of the city by the

6 Sha'ūb in al-Hamdānī's *Ṣifah*, but the modern pronunciation is clearly Shu'ūb.
7 Op. cit., 133.
8 Vocalisation uncertain.
9 The name 'Alīb should undoubtedly be read as 'Alab, and the reading in the printed text be accounted a simple copyist's error, since 'Alīb appears in none of the sources consulted. Yaḥya b. al-Ḥusayn al-Qāsim, *Ghāyat al-amānī*, Cairo 1338 H, 182-3, speaks of a fort, Qal'at 'Alab, and, ibid, 246, an Imām builds there a fort of baked brick.
10 Op.cit., 89.
11 Al-Manshar is vocalised after a place-name in al-Hamdānī's *Ṣifah*. Al-Manāshir or al-Manāfis are the arch-covered spaces in the wall over the Sā'ilah for the passage of floodwater. Rossi, op. cit., 358, *apertura di afflusso del canale*.
12 Ibid, 133.
13 Ibid, 323.
14 Ibid, 106 seq.
15 Al-Hamdānī, *Iklīl I*, ed. Muḥammad al-Akwa', 414 seq.: ed. Löfgren, Uppsala, 1965, II, 175.
16 Cf. *fusṭāt*.
17 A word still in current use, explained as *sāqiyah ṣaghīrah min al-ghayl al-kabīr*.
18 Akwa' considers *rādi'* a proper name, but one wonders if it is not some technical irrigation term.

**The region of Ṣan'ā'** Map showing the *ghayls* running into the city with an aerial view (above) of the built up area.





present day Bāb Shu'ūb. This would tally with the information from the Jewish sources. Literary evidence available to us is inconclusive but documents might well provide accurate data, especially the *Miswaddah* of Sinān Pasha when it becomes possible to study it closely.

Al-Rāzī's[19] account runs, 'It is a river (*nahr*) in Ṣan'ā', the advantage (*manfa'ah*) of which is evident there—they could not do without it for washing their clothes. It was a charitable act (*ṣadaqah*) which he (al-Barmakī) performed for them and through which he made good their drinking places (*sūbul* sing., *sabīl*) right up to Mecca.' He adds, 'Muḥammad b. Khālid . . . was the one who introduced Ghayl Ṣan'ā' and its drinking places. He collected the people so that he made them bear witness concerning it to him, and he swore by God Exalted that he had spent none of the money of the Authority (*māl al-Sulṭān*) on it, but only what was lawful (*ḥalāl*).'

Yāqūt[20] the geographer, about the first quarter of the 13th century A.D., calls Ghayl al-Barmakī a river (*nahr*) which splits (*yashuqq*) Ṣan'ā' of the Yemen, about which their poet says,

Alas, O weeping, when the lover be far
From his beloved—to whom makes he his plaint?
To me then will he complain and to the city (*balad*),
His tears flowing like the Ghayl al-Barmakī.

This is unmetrical verse[21], but nevertheless suitable for singing, which I have quoted as I heard it from the shaykh Abu 'l-Rabī' Sulaymān b. 'Abdullāh al-Rayḥānī, my friend, God succour him. Abū 'Alī has cited a verse by Abu 'l-Jayyāsh,

The Ghayl is two sides, between which lodges baseness of degree,
The side of the clients (*mawālī*), and the side of houses (*ḥillah*) of the Arabs.[22]

An important extension of the Ghayl al-Barmakī, of which Yāqūt had probably not heard when compiling the *Mu'jam,* was made by the Ayyūbid, Ṭughtakīn,[23] in 601/1204-5, when he made al-Nahr al-Barmakī run to Bustān al-Sulṭān, the new Quarter to the west of the Sā'ilah. This was to supply the bath (*ḥammām*)[24] which he had made there in his garden—hence the name of the Quarter, Bustān al-Sulṭān—and, of course, to irrigate the garden itself.

Writing about 1260 A.D., the traveller Ibn al-Mujāwir[25] notes that, coming to Ṣan'ā' from the south, the distance from Naqīl Yislaḥ to Ghayl al-Barmakī which enters Ṣan'ā' from the south would be four *farsakhs,* a *farsakh* being about three miles. Often reporting more like a journalist than a scholar, he states that a Barmakī fleeing from Hārūn al-Rashīd made it, constituting it a *waqf* to the weak (*ḍu'afā'*) of Ṣan'ā'. By *ḍu'afā'* it seems likely that he means the inhabitants of the city who belonged to the classes which did not bear arms. Al-Barmakī finding water scarce with the Ṣan'ānīs, bought the land in Qā' 'Abbād b. al-Fakhr—which should be corrected to 'Abbād b. al-Ghamr (with Hamdānī)—and dug a great river (*nahr*) in it. He adds[26] that 'the drinking of the inhabitants from Ghayl al-Barmakī, already mentioned, is agreeable to him who drinks it.' In view of what al-Rāzī says, and because today all the people near al-Barmakī aver that it was only used to irrigate the cultivated land of al-Ṣāfiyah al-Sharqiyyah, it is unlikely to have been used much for human consumption.

Without further careful field-work one can only speculate that perhaps Ghayl al-Barmakī may have taken the place of Ghayl 'Alab. With the extension of the new city in the south easterly direction it may be now difficult or impossible however to find the ancient route of the latter.

A puzzling entry in the chronicle *Ghāyat al-amānī*[27] states that al-Muẓaffar entered Ṣan'ā', and camped in the Maydān at the Mosque of al-Sayyidah bint Aḥmad al-Ṣulayḥī, built on the bank of the water-channel (*'alā shāṭi' sāqiyat*) of Ghayl al-Barmakī in the year 671/1272-3. In default of further evidence at the moment of writing it is suggested that the location of this mosque lay in the open country south of Ṣan'ā'.

Al-Barmakī was in good repair (*'āmir*) when, in 803/1400-1, the Imām al-Manṣūr Ṣalāḥ al-Dīn turned his attention to the springs of al-Ghayl al-Aswad.[28] Yet it was to suffer deliberate destruction when the Ṭāhirid Sulṭān 'Āmir b. Ṭāhir arrived in Muḥarram of the year 870/August 1465 to besiege Ṣan'ā'.[29] 'He had assembled one thousand head of cattle to wipe out (*taghwīr*)[30] the remaining wells (he had already destroyed some ouside Ṣan'ā' in the previous year) and the streams (*anhār*) around Ṣan'ā'. When he arrived at the foot (*safḥ*) of Bayt Baws he commanded Ghayl Alāf and Ghayl al-Barmakī to be diverted/caused to disappear (*taghwīr*), it (al-Barmakī) being a blessed (*mubārak*) *ghayl*, with many bends on the fields/earth (*awṭān*)[31] of Ṣan'ā', flowing perennially—and the traces of it were obliterated. He ordered the trees of Ḥaddah to be cut and its streams to be diverted (*taghwīr anhāri-hā*). He took great pains over this, even passing himself in person by those working under (his) orders, to see what they were doing.'

Up to the present we have not come upon any record of the re-excavation of al-Barmakī in the histories consulted, but the floods of late Muḥarram, 1060/late September, 1650 which destroyed the arches of the south and northern Khanādiq of the Sā'ilah, also buried (*dafana*) the *ghayls* of the dam/barrage (*sadd*)—which (*ghayls*) had been made to issue forth.[32] From a much later notice quoted below it seems that one of these *ghayls* was al-Barmakī. Possibly al-Barmakī may also have been destroyed again in the floods of Jumādā I, 1083/September, 1672 when floods from the Artil-Bayt Baws area collected at the Khandaq of Ṣan'ā', but it is not specifically mentioned.[33]

The reign of the Imām al-Mahdī 'Abbās, notable in the general history of Ṣan'ā', also saw a revival of the *ghayls* which in the interval evidently fell into disrepair or disuse. Zabārah[34] tells us that

> part of the good intent of this Imām, our Lord the Commander of the Faithful, was the coming into being of these three rivers (*anhār*), the plentiful *ghayls* of his period in Ḥaql Ṣan'ā' on the south ('Adan) direction, and his bringing them forth when they had been buried over (*madfūnah*), as it is said, from the people of Tubba', they being the men of As'ad al-Kāmil, as it says in some of the (Qur'ān) commentaries, but the *ghayl* called Ghayl Ālāf was not one of these. After their (re-)appearance the sown land increased and people were relieved from the toil of well irrigation (*al-masnā*).

19 Loc. cit.
20 *Mu'jam al-buldān*, edit. F. Wüstenfeld, Leipzig, 1868, II, 830, but for his *lawm* must be read *lu'm* with oriental editions of the text.
21 Ar., *shi'r ghayr mawzūn wa-huwa ma'a dhālika malḥūn*. The full prosodic sense of *malḥūn* cannot be discussed here, but these are interesting verses of *Ḥumaynī* type.
22 Abu 'l-Jayyāsh's verse must refer to Zabīd and not to Ṣan'ā', The *mawālī* in this case are likely to be non-Arabs of the area of African descent.
23 *Ghāyat al-amānī*, 337; Muḥammad b. Muḥammad Zabārah, *A'immat al-Yaman*, I, Cairo, 1376 or 1379 H, 113.
24 Cf. p.616.
25 Ibn al-Mujāwir, *Descriptio Arabiae Meridionalis, Ta'rīḫ al-mustabṣir*, ed. O. Löfgren, Leiden, 1951-54, 178.
26 Ibid, 185.
27 Op. cit., 457.
28 *A'immat al-Yaman*, I, 292; ibid, I, 336.
29 *Ghāyat al-amānī*, 599.
30 *Ghawwar* according to Dozy, *Supplément*, means *faire absorber les eaux par la terre*. In the Ṣan'ā' region it can also mean to make a hole or build a hole in a wall for water to pass through. Since 'Āmir brought so many oxen his intention must surely have been to fill in the *ghayls* by pushing back the spoil excavated from them and lying around the access pits or funnels at intervals along their courses.
31 Sayyid Aḥmad al-Shāmī informs me that *awṭān* means *ḥuqūl*, fields. One says *jirbah waṭan-hā kabīr ghaniyy*, a field with abundant rich earth; *al-turāb waṭan - yiddī khayrāt kathīr*, the earth is good earth, producing abundant harvest; *waṭan-ih qalīl khafīf*, its earth is little, light; *māfīh 'inda-hā waṭan*, it has no good earth.
32 Al-Wazīr, *Ṭabaq al-ḥalwā*, Chester Beatty Collection, Dublin, ms, 30b.
33 Ibid, 95a.
34 Muḥammad b. Muḥammad Zabārah, *Nashr al-'arf*, II, Cairo, 1377 H, 248 seq. Cf. al-Jirāfī, *al-Muqtaṭaf*, Cairo, 1370/1951, 150, who says it was 'concealed (*maṭmūr*) from a distant age'.

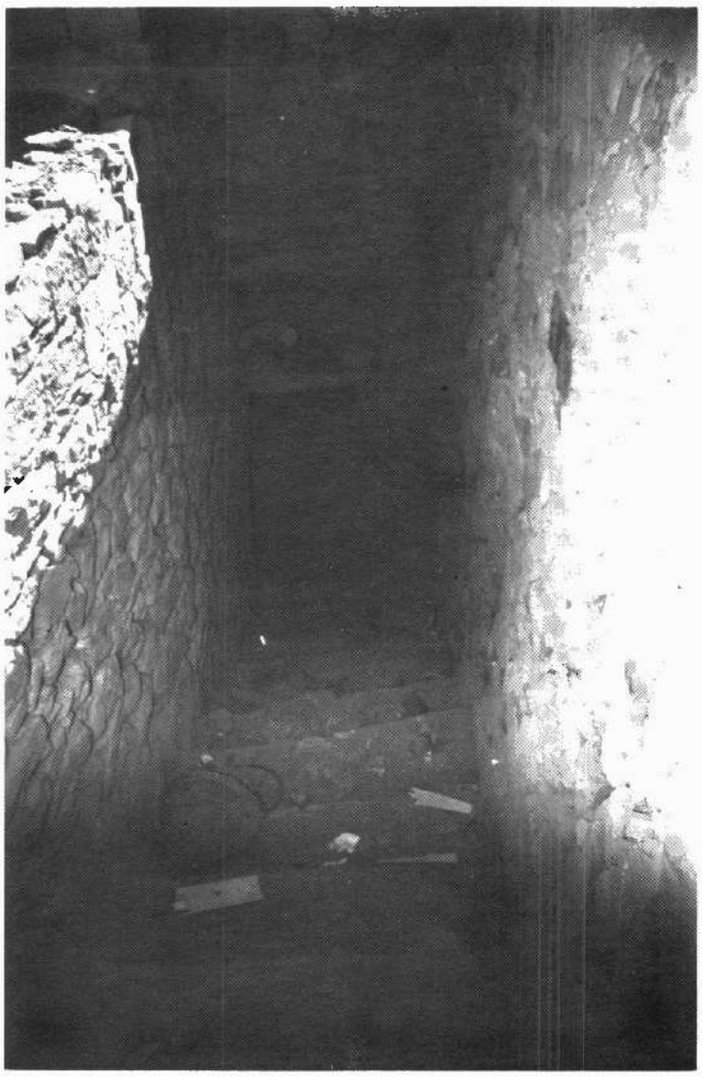
. . . In the year 1177/1763-4 he ordered the excavation of the watercourses (*majārī*) of al-Ghayl al-Aswad and its spring/source (*manba'*) in the Qā' which lies west of the village of al-Jardā' and east of the village of Bayt Sibṭān, a distance of about two hours south of the city of Ṣan'ā', as well as the excavation of the water-courses of Ghayl al-Barmakī and its source (*manba'*) from around the village of Bayt 'Uqub and the village of Ghaymān, a distance of about three hours south east of Ṣan'ā'. After the excavation of the water-courses of the two, and getting the use of them, there came from the Qāḍī Ismā'īl b. Yaḥyā al-Ṣiddīq, one of the governors (*ḥukkām*) of Ṣan'ā', the written text of a decision by him (*taḥrīr al-raqm min-hu*), dated Ramaḍān of the year 1180/February, 1767. The gist of his decision (*raqm*), as I read it, is that the tracks (*āthār*)[35] of al-Ghayl al-Aswad and Ghayl al-Barmakī had been put right (*uḥkimat*) by the far-reaching dam/barrage (? *al-sadd al-bāligh*),[36] but (these tracks, *āthār*) and been effaced, and people had made these water-courses into sown land. So al-Mahdī repaired them, and the afore-said Governor ordered the Mashāyikh of the Wādī Shu'ūb/Sha'ūb, Bīr al-'Azab, Ḥaddah, and Bayt Baws to put a valuation on them, and their valuation of the two came to 700 *riyāls*. The afore-mentioned Governor chose the option (*rajjaḥa*) of selling them with their water-courses and all pertaining to them by *shar'* law and custom (*'urf*), to the Factor of the Treasury (Wakīl Bayt al-Māl), to al-Mahdī al-'Abbās for 1400 *riyāls*. Al-Mahdī remitted the price determined by the Governor afore-said to the factor of his (personal) holdings (*amlāk*), the *faqīh* 'Alī b. 'Abdullāh al-'Amrī.[37]

This 'Alī b. 'Abdullāh al-'Amrī, called al-Ṣan'ānī of the well known *qāḍī* family of Government officials (who died in 1183/1769-70) had 'under his surveillance many posts (*waẓā'if*) connected with the Imām, including building (*al-'imārah*), whatever it was, for the Government (Dawlah), the administration (*siyāsah*) of the city, the punishment of anyone who revolted against the path of obedience to God and His Apostle, the putting down of irresponsibles (*sufahā'*) of people whom he "shall know them by their token" (Qur'ān, II, 273), the inspection of the workmen (*al-ṭiyāfah 'ala 'l-'āmilīn*) excavating the shafts (*kaẓā'im*) of the *ghayls* and repairing them.'[38] In true Yemeni administrative tradition, be the ruler sultan or imām, al-Mahdī, 'the Imām, the Caliph of God Exalted, seized from him his house and horses, committed him to prison, and exacted from him the handing over of his property/money which he specified as an obligation on him.' Zabārah comments, 'This is a thing which, in God's knowledge, has happened before.'

When Halévy visited the Yemen in 1869 al-Barmakī had dried up, and only al-Ghayl al-Aswad, and, to a smaller extent, Ghayl Ālāf were still active.[39] Zabārah writing of very recent times, states that al-Ghayl al-Aswad still cuts through (*yashuqq*) Ṣan'ā' and irrigates some of the properties in Wādī Shu'ūb, but Ghayl al-Barmakī has become very weak so that in these years of the 14th/20th century it has only irrigated a part of the properties of Maḥall Dā' al-Khayr, south of Ṣan'ā'.[40]

# Ghayl al-Barmakī in 1975

The catchment area of the *ghayl* lies midway between the village of Dār Salm and the southern side of Jabal Nuqum. At the source of the *ghayl* there are about twenty wells to the south of al-Jardā' village. The course of the *ghayl* runs underground in a more or less north westerly direction, receiving also water from a branch *ghayl* called al-Manṣūrī which starts a few hundred metres to the south east. Al-Barmakī runs at an average depth of 7m for a total length of about 500m. The outlet at the point where the underground channel emerges into the open is a highly sophisticated structure—three flights of steps lead down to water level, obviously to allow people to draw water from the channel. The staircase and its walls are carefully built in dressed stone. Originally part of the staircase was probably roofed. It then continues in the open for about 800m until it flows into a cistern of about 24m × 31m. This is a few hundred metres south east of Bayt Mi'yād village, from which the *ghayl* then runs approximately northwards to irrigate the area beyond the village. However, before it comes to Bayt Mi'yād the *ghayl* has already split into three branches at a very old garden 300m south of the village—which indicates that at least part of the *ghayl* did not go to Ṣan'ā' but irrigated the fields south and west of Bayt Mi'yād in al-Ṣāfiyah.



2.1 Al-Ghayl al-Aswad. The southern stairs to the water channel.

# Al-Ghayl al-Aswad

The sources consulted say nothing of al-Aswad before the opening years of the 9th/14th century though it had certainly existed in some state or another in the 8th/13th century. If negative evidence has any value it may be pointed out that Ibn

35 *Āthār*, lit. traces, steps - perhaps a technical word here; perhaps it refers to the line of mounds on the ground above the water-course, formed by the spoil removed to form the channel.

36 The sense of this whole sentence is completely uncertain to us.

37 *Nashr al-'arf*, II, 14. Presumably the text means that al-Mahdī gave the money to al-'Amrī to buy the *ghayls* to add to his personal holdings.

38 Ibid, II, 248-9.

39 See p. 137b.

40 *Nashr al-'arf*, II, 13.

al-Mujāwir, about 1260 A.D. mentions only al-Barmakī, but though al-Aswad is neglected by the sources prior to the first date, this is inconclusive.

'In this year (803/1400-1)', says the author of *Ghāyat al-amānī*,[41] 'Alī b. Ṣalāḥ al-Dīn ordered Ghayl al-Aswad,[42] south of[43] Ṣan'ā', to be excavated and its water-courses to be repaired, when previously they had been covered over (probably with earth, *datharat*) and become dilapidated/demolished. Water appeared and reached al-Bustān (Bustān al-Sulṭān) and Sha'ūb. The place where it first comes out (*aṣl makhraji-hi*) is from Qā' Artil below Ghayl Ālāf. Ghayl al-Barmakī was in good repair at this time.' Our sources do not name al-Aswad as having been destroyed by the Ṭāhirid sultan 'Āmir in the 9th/15th century, though it is likely that it shared the fate of the other *ghayls*, but, as already seen, it was re-excavated in the year 1177/1763-4.

This is the only *ghayl* which runs underground from the beginning to the end of its course. It originates about the plain east of Jabal al-Nahdayn—perhaps more correctly called Ḥaddayn, at a distance of about 200m from it and from Ghayl Ālāf. The catchment system is formed by 16 wells. Its channel runs northwards at an average depth of 6m, crosses the bed of the Sā'ilah, and enters the environs of Ṣan'ā' near the mosque of al-Jarādī. This latter is the first of four places at which there is access to the water of the *ghayl*. Near this very small mosque there is a little cistern at ground level, and a double staircase bending slightly to the left, leading down to the *ghayl*. At present both sides of the staircase are blocked with bricks near the actual level of the *ghayl*. A few metres north west of al-Jarādī mosque lies al-Bilaylī Mosque, then comes al-Bahlūlī Mosque. From here the channel runs straight for about 500m, then crosses a drainage canal which runs parallel to the town wall of Ṣan'ā'. From this point the *ghayl* turns towards the north west again, then runs in a straight line, more or less in the centre of the post-1962 Shāri' 'Alī 'Abd al-Mughnī, up to Dār al-Shukr and the Mutawakkil Mosque.[44]

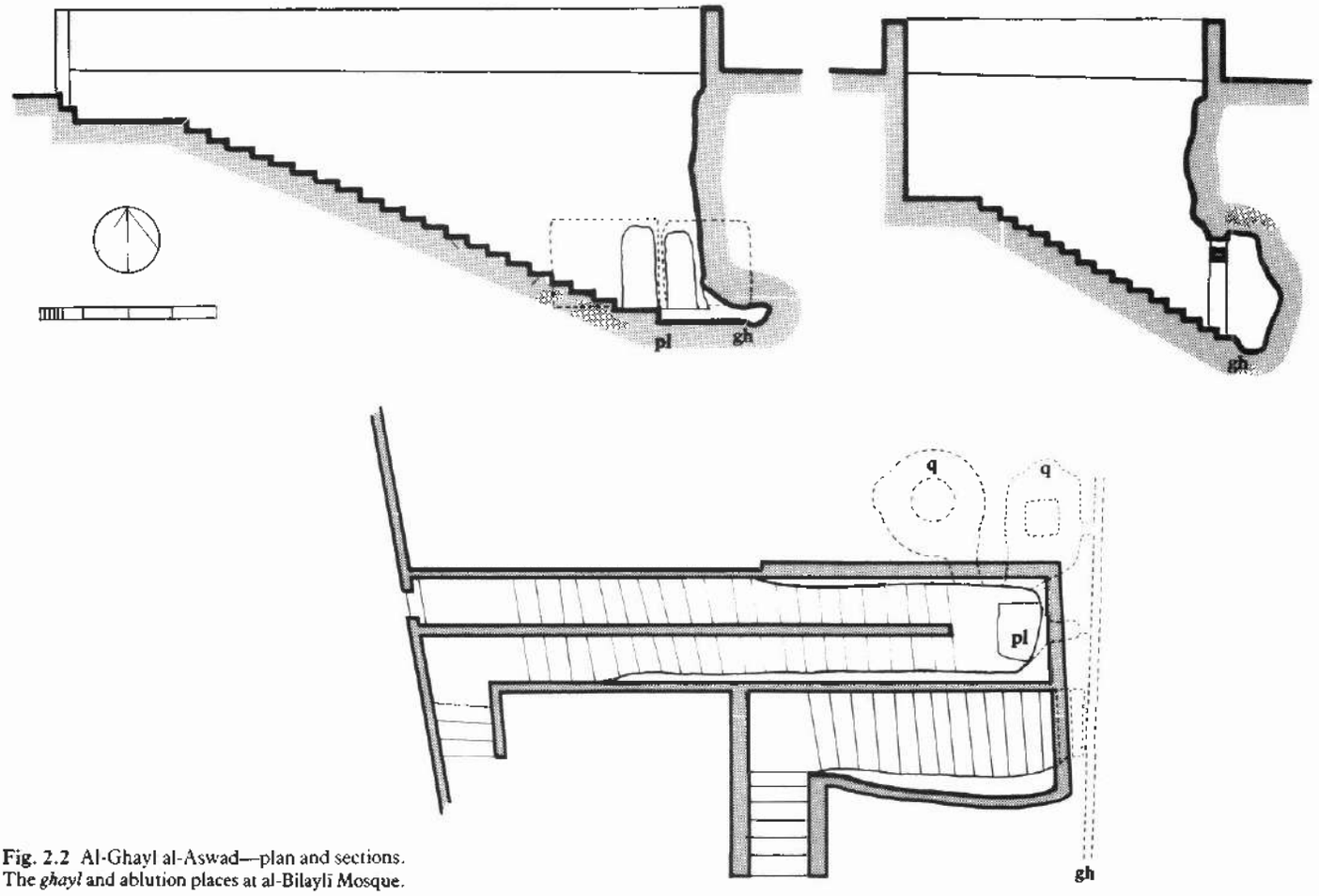
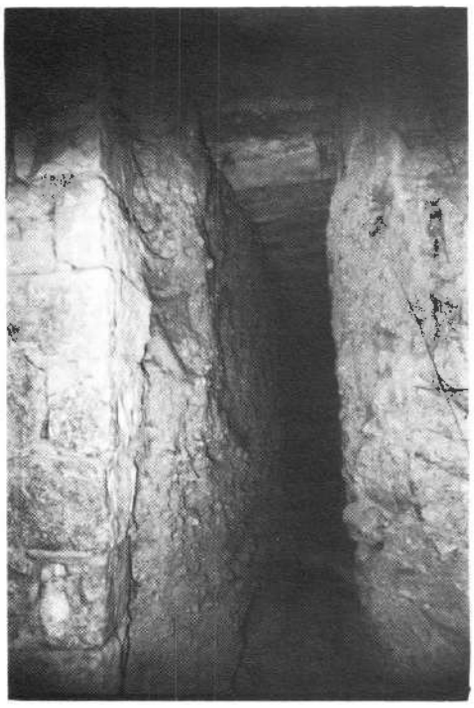



**Fig. 2.2** Al-Ghayl al-Aswad—plan and sections.
The *ghayl* and ablution places at al-Bilaylī Mosque.

**Key to all figures**

| | | | |
|---|---|---|---|
| **a** animal stalls | **b** bathroom | **br** boiler | **c** court |
| **cu** court upper level | **ch** changing room | **d** *dīwān* | **e** entrance hall |
| **eu** entrance hall upper level | **f** warm room | **fr** furnace room | **g** grinding mills |
| **gh** *ghayl*—water level | **h** excrement room | **hr** hot room | **j** grain and fruit store |
| **k** kitchen | **l** lobby | **lt** laundry terrace | **lb** lavatory/bathroom |
| **m** *mafraj* | **mn** minaret | **n** *miḥrāb* | **nw** washing floor |
| **o** loading and mounting animals | **or** restaurant/eating place | **p** passage | **pl** pool |
| **plr** cold pool room | **q** public ablution area | **r** room—general use and sleeping | **rr** reception room and business |
| **rl** library | **s** store | **sh** sheep pens | **sp** shop |
| **t** terrace | **tm** tomb | **tr** treasury | **u** shaft |
| **v** rain water cistern | **vm** man in charge | **w** well | **wb** water cooling box |
| **wr** well ramp | **x** *minbar* | **y** women's room and wardrobe | **z** *manẓar* |

41 Op. cit., 559. Cf. *A'immat al-Yaman*, I, 292.
42 Note this form, the Ghayl of al-Aswad, not the Black Ghayl as the name is given elsewhere.
43 For the text's *'adl* we must read *'Adan*.
44 Al-Wāsi'ī, *Al-Badr al-muzīl*, Cairo, 1345 H, 10, says that al-Aswad enters Ṣan'ā' towards two mosques, Masjid al-Mutawakkil and Masjid Ḥajar at Bāb al-Sabaḥah (Cf. *Masājid Ṣan'ā'*, 43). It then enters Bustān al-Mutawakkil and comes out at Shu'ūb, north of Ṣan'ā', to water the lands (*arāḍī*) up to al-Jirāf. Masjid Ḥajar was unfortunately demolished during the Egyptian occupation of Ṣan'ā'.



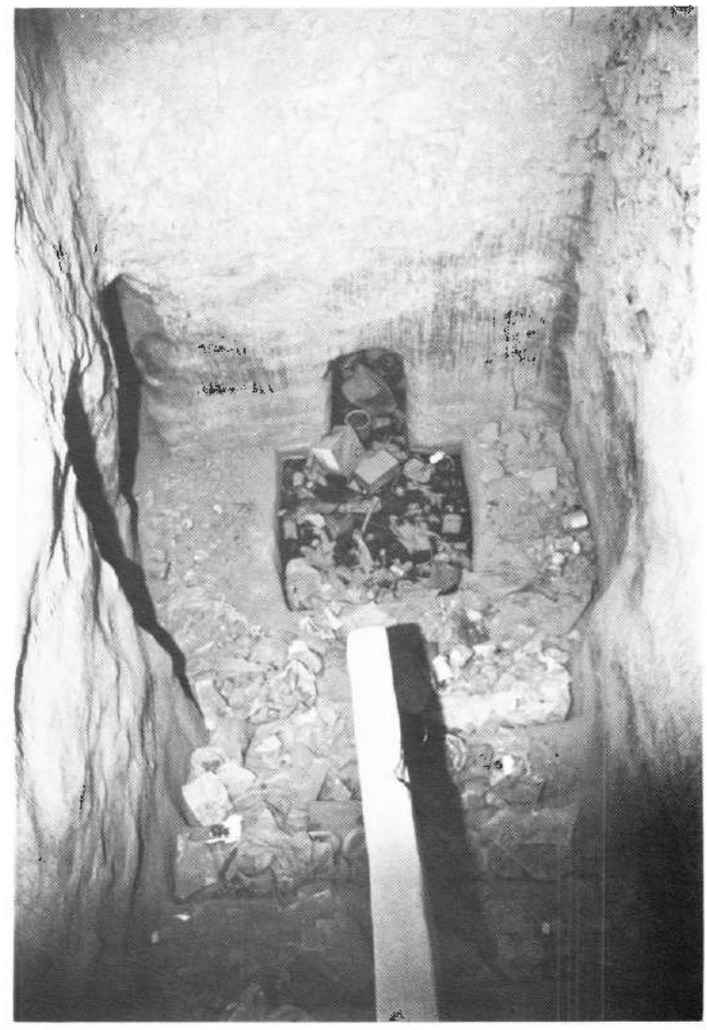
2.2 Al-Ghayl al-Aswad. Looking along the water channel.

Outside the Mutawakkil Mosque can still be seen the flat *muqaḍḍaḍ* open space known as *miṣbānah*,[45] the wash-place for women, made by Imām Yaḥyā b. al-Manṣūr, though it is now not in use since the water supply of the *ghayl* has been cut off. Ḥammām al-Mutawakkil is also on al-Ghayl al-Aswad. Inside the Mutawakkil Palace the channel is still well preserved-along the *bustān* to the *mafraj* of Imām Yaḥyā at the end of it. The *ghayl* supplied water to the *mafraj*, then it runs under the mud wall still around the *mafraj* into the open—close by it outside the wall, is a well known as Bīr Khayrān. At no great distance in time, the course of al-Ghayl al-Aswad continued beyond the Mutawakkil Mosque to the Bustān al-Yahūd/Yahūdī of Arabic writers—on this land now stands al-Qiyādat al-'Āmmah li-' l-Quwwāt al-Musallaḥah, the Forces G.H.Q., in a building said to have been sequestrated from the Imām al-Badr.

Zabārah[46] informs us that, in the year 1314/1896-7, the Mayor (Ra'īs al-Baladiyyah), Muḥammad b. Muḥammad al-Bilaylī the Ṣan'ānī, completed the building of the well-known mosque in the Ṣāfiyah, south of Ṣan'ā', on the right of a person going out in the direction of Ḥaddah and Ṣan'ā', in addition to the excavation and construction of the well and *sabīl* from which the passer-by on the road drinks, and the cistern connected with it for sheep-and-goats to drink. He brought the water of al-Ghayl al-Aswad into the ablution places (*mutawaḍḍayāt*), expending much money on perfecting the building.

We visited the Bilaylī Mosque in November 1975. Access to the *ghayl* water is from inside the mosque area, and there is a more complicated approach to it than in the next mosque lower down on the water-course, al-Bahlūlī. One descends a staircase divided into two, and those wishing to perform the ablution descend by the left side and, after washing (*yitwaḍḍaw li-'l-ṣalāh*), return ascending the right side, carrying their shoes in their hands. At the foot of the stairs are little ablution rooms called *masfā* (pl., *maṣāfī*) for men, and one for women, where there are little shallow pools—the waste water from them is thought to have drained away from them, not to have returned to the course of the *ghayl*. *Masājid Ṣan'ā'*[47] calls them *miṭhār*, and says there is one for washing (*ightisāl*) and one for the ritual ablution (*li-'l-wuḍū'*).

45 Muḥammad b. Aḥmad al-Ḥajarī, *Masājid Ṣan'ā'*, Ṣan'ā', 1361/1942. Cf. Mohammed Hassan, *Heart of Yemen*, Baghdad, 1947, 81.
46 *A'immat al-Yaman*, (2), II, 203.



2.3 Al-Ghayl al-Aswad. The pool at the bottom of the northern stairs.

The people here maintained that the water in the course of the channel used to flow at a height of three quarters of a metre and showed us the mark on the top of the flow on the side in support of their statement. The *ghayl* is cut through the natural packed gravel and earth layers of the area and a man can walk upright along the water-course. Outside the mosque, as Zabārah says, there is a well leading to the *ghayl* so that a woman could draw water, but it is now covered over. There was also a *manza'ah* for sheep. It seems that, via this well, the cleaners (*maṣṣārīn*) could remove any accumulations from the *ghayl* or the ablution rooms attached to it.

For al-Bilaylī Mosque there are said to be legal documents (*baṣā'ir*) with the al-Wishāḥ house, and Bayt al-'Anqād farmed it—the water was sold by the *ṭāṣah*. The *ṭāṣah*, as described by Rossi,[48] is a metal pot with a hole of known size—this is used as a time measure—it taking 11 minutes 15 seconds for a *āṣah* filled with water to empty itself. At Shu'ūb where he saw water being distributed from al-Ghayl al-Aswad to the fields, a 24 hour allotment of water is called a *farḍ* and is equivalent to 128 *ṭīṣān* (pl. of *ṭāṣah*), but smaller allotments can be made by the manager of the water called a *dā'ilī*, down to a *rub' thumun* of a *ṭāṣah* which would come to 3/4 of an hour. In practice the *dā'ilī* calculates longer periods by the shadow of the sun. Rossi adds that the register of the distribution of the water of al-Ghayl al-Aswad is kept with a certain al-Razzāqī at Ṣan'ā'. Measures for water distribution seem to vary even in other villages quite close to Ṣan'ā'.

47 Op. cit., 22, which says that near the mosque is a small prayer-place (*muṣallā*) for women, which has another path to the *ghayl* for drawing water (*ightirāf*) and washing (*ṭahārah*).
48 Op. cit., 252-3, 355.

At al-Bahlūlī, the next mosque in the series, but outside the actual mosque itself, a stairway, also divided into two by a low wall, leads down to the channel of the *ghayl* called *majall al-mā'*. The roof of the *ghayl* is covered by a sort of paving stones. As in al-Bilaylī there are *maṣāfi* rooms with a small pool in the middle, different rooms being assigned to men and women. The arch inside the bathing-room is called *jalaylah* (pl., *jalāyil*) which Dr Maqṭarī suggests is derived from the phrase often written inside such an arch as those, *Allāh, jalla jalālu-hu.*

Informants at the Bahlūlī Mosque insisted that the *ghayl* is not a *waqf* but belongs to the farmers (*mamlūk al-zurrā'*) who have cut off the water above (*iḥtajazu ṭāli'*). They suggested that the people of Ṣan'ā' of Shāri' 'Alī 'Abd al-Mughnī have refused to pay their share for the maintenance of the *ghayl*, and that they took the water for nothing (*akhadhu 'l-mayy bi-dūn muqābil*).

It would be interesting to obtain copies of the agreements for al-Ghayl al-Aswad which should show how the *ghayl* used to be maintained and who is responsible for the expenses involved, but this task we have left until a possible subsequent occasion.

The late Muḥammad Aḥmad Nu'mān some time before he was murdered in Beirut in 1974 is said to have put up the sum of 100,000 *riyāls* to have something done about bringing al-Ghayl al-Aswad into commission once more.

When the *ghayl* used to run there was two kinds of fish in it, both simply being called *al-ḥūti*; Ṣan'ā' small boys are said to have liked playing with them.

# Ghayl Ālāf

One of the notable acts (*ma'āthir*) of the Imām al-Qāsim b. 'Alī (ob. 393/1002-3) was to bring forth the Ghayl Ālāf by the hand of his governor al-Zaydī, south of Ṣan'ā'.[49] Ghayl Ālāf was extended by Ṭughtakīn b. Ayyūb to Bustān al-Sulṭān. It was one of the *ghayls* destroyed by Sultan 'Āmir the Ṭāhirid in 870/1465. The poet al-Khafanjī[50] (ob. 1180/1766-7) makes Bīr al-'Azab boast, 'I have Ghayl Ālāf.' It also has a proverb of its own of the standard type, *'Ghayl Ālāf yisqī li-ghayr ahl-ih*, Ghayl Ālāf irrigates/waters people other than its own.'[51] The people in the upper localities derive no advantage from the *ghayl* passing through their own territory. Ghayl Ālāf is owned half by Bayt Zuhrah, and the rest by owners (*mullāk*) among whom are to be counted the Yemeni Government, Bayt al-Jirāfī and Bayt al-'Amrī. Bayr Zuhrah stem from an ancestor, 'Abdullāh Shā'if Zuhrah of Dhū Muḥammad, from Urjūzah in Barat, who transferred to Ṣan'ā'—they were cultivators (*zurrā'*) and have now become Mashāyikh of Bīr al-'Azab.

Ghayl Ālāf is now the largest of the southern *ghayls*. Its source (*manba'*) is from a small valley opposite the village of Artil. At this source, according to Husayn al-Shāyif, are *dayāwīn* (sing. *al-dīwān*) which he described as stones high up in the air down which water trickles. At any rate, the catchment area is formed by some fifty wells. The *ghayl* runs in a straight northerly direction underground for about a kilometre, then debouches into a large collecting cistern which seems to have been at least partly roofed. This cistern is square and measures about 20m a side.[52] Now it is silted up so that the exact depth cannot be measured. It has been suggested that it also draws on the Sawād Ḥizyaz.

From the cistern the canal runs, open to the sky, sometimes straight, sometimes zigzagging northwards round the eastern hill of Jabal al-Nahdayn or Ḥaddayn, becoming very deep and impressive towards the north west. It then turns again northwards to run along the eastern edge of the old military airfield.[53] From the north eastern corner of the runway the channel zigzags for about 300m, then it branches out into many small channels which are invisible nowadays beneath hundreds of new buildings. One branch of the canal is still visible along the road to Bāb al-Khuzaymah, more or less in front of the large Jā'ifī house where there is a group of old buildings.

Near Bayt Mi'yād, on the western side of it, all the wells of the channel, intended for cleaning, are visible and well preserved. One of these wells, the nearest to the house of Bayt Mi'yād, shows many deep ruts made by the well ropes in the stones of the casing of the well-head. Obviously the inhabitants of the village used it to draw water from the channel for a long time. Probably they had some special right to do so, and this would be worth investigation.

Ghayl Ālāf is said to have supplied water to the fields of the Ṣāfiyah, then it went on to Bayt al-Zuhrah from which it flowed northwards through Bīr al-'Azab and Bīr al-Shams as far as al-Jirāf. South of this village there are actually remains of several large cisterns, but it is impossible nowadays to follow on the ground the course of the channel through the town. North of Bīr al-Shams some channels are visible running in a northerly direction, but it is not possible to ascertain whether any of them is Ghayl Ālāf. Mohammed Hassan[54] speaks of Ghayl Ālāf as being near Bāb al-Ṣabāḥ, also removed during the Egyptian occupation.

# Al-Nahrayn

Ghayl al-Barmakī and al-Ghayl al-Aswad were both, as stated to us, known to have entered Ṣan'ā' from the Upper Khanādiq, the wall set on arches runs over the Sā'ilah or flood-bed on the southern side of the city. This nevertheless seems unlikely in the case of al-Barmakī. After al-Barmakī had been extended to Bustān al-Sulṭān, and, whenever it was that there came into being the two *ghayls* in Bustān al-Sulṭān, the northern and lower part of this Quarter lying west of the Sā'ilah were known as al-Nahrayn, the two rivers or *ghayls*, and this gave the name to the Masjid al-Nahrayn there.

# *Ghayls* from Jabal Nuqum

In the year 985/1577-8 or thereabouts the Ottoman Murād Bāshā is said to have made water flow to the Murādiyyah Mosque which he had constructed and to the Qaṣr from Ghayl al-Bāshā at the lowest part of Jabal Nuqum, where traces of the concreting (*qaḍāḍ*) of the *sāqiyah* or water-channel from Ghayl al-Bāshā to al-Qaṣr are said by Zabārah[55] to be still evident on the ground.

From Masjid Nuqum, an ancient foundation, or a little below it we went to see the *ghayl* called Ghuzl Bāsh (doubtless Qizil Bāsh) with Nāṣir al-Ru'aynī. It seems fairly certain that this is to be identified with Murād Bāshā's *ghayl*. Al-Ru'aynī showed us a square well of excellent masonry with footholes for steps in the side, down which one descends to the bottom. In the wall there, are said to be arches from underneath which passages can be entered, though there is only enough room for a small child to pass along. One passage is said to communicate with an underground cistern (*birkah*) in which there is an iron door made by the Turks behind which are held the treasures of Ḥimyar! The door, on each side, is however guarded by the Jinn, by two slaves (*'abd*). The *birkah* is believed to lie under an adjoining hillock approached by this passage. If in fact there be such passages, then some may come from catchment areas in the

49 *Ghāyat al-amānī*, 234; cf. al-Jarmūzī, *al-Sīrat*, ms. Mukallā, 557.

50 *Nashr al-'arf*, II, 196; Aḥmad Ḥusayn Sharaf al-Dīn, *al-Ṭarā'if al-mukhtārah min shi'r al-Khafanjī wa-'l-Qārah*, Cairo(?), 1970, 30; *Masājid Ṣan'ā'*, 75.

51 Qāḍī Ismā'īl al-Akwa', unpublished section of *al-Amthāl*.

52 This measurement requires confirmation.

53 It is said that during the Egyptian occupation Royalist tribesmen used this *ghayl* to approach the airport and ambush a high-ranking Egyptian officer, arriving or taking off from the airport. This appears unsubstantiated.

54 Op. cit., 81. *Al-Badr al-muzīl*, 3, states that it enters Bīr al-'Azab after irrigating al-Ṣāfiyah, i.e. lands and crops south of Ṣan'ā'.

55 *A'immat al-Yaman*, I, 482.

mountain, but one passage must be an exit—carrying on down-wadi from the well-bottom. Lower down the wadi is a cistern with a barrel-vaulted roof on top of which is a flat masonry praying-place to which one ascends from ablution tanks that would be supplied from the vaulted cistern which has a sort of window facing downstream with a rough modern temporary iron network of bars to protect it. The praying place looks now disused. We continued down the wadi to the point where the rough mountain slope ends and fields begin—here there had been a cistern but it has been removed, seemingly fairly recently. The wadi or gulley in which this *ghayl* lies seems known as Wādi 'l-Qaṣr. With the great extension of new building in this area it would be difficult to trace the course of the *ghayl* to inside the Ṣan'ā' walls. It is said however to join the Bīr al-Bāshā/al-Bāsh, described by al-Ḥajarī[56] as the 'great benefaction (*maḥsinah*)', near a small mosque he constructed also in the vicinity of Masjid al-Ḥaymī. Qāḍī Ismā'īl said this well is in the high part of the city and has the best and sweetest water, and he cited the proverb, *'Lāzim 'alā man 'ashiq yaṭḥan wa-yiddi 'l-mā min al-Bāsh,* He who is in love must grind (grain) and fetch water from al-Bāsh well.' Both these are hard work executed by women.

Another little gulley called 'Ayn al-Faqīh flows towards Bāb al-Yaman when there is rain, but it does not seem important.

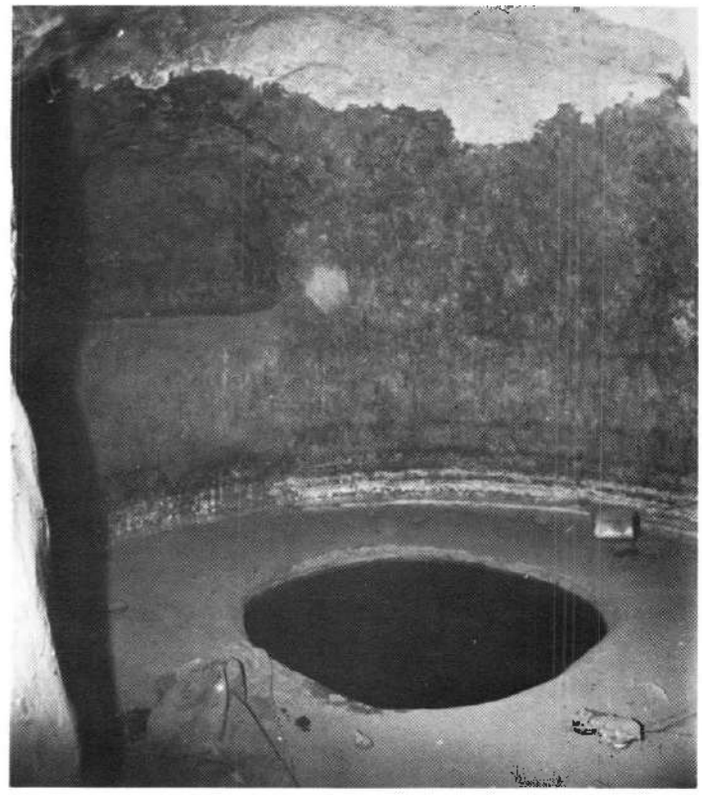
# The Northern *Ghayls*

Since these *ghayls* do not actually serve the city of Ṣan'ā' we have only been able to devote a limited amount of field research to them, yet their importance because they serve the villages just outside Ṣan'ā' is obvious, and some of the historical data are also relevant to the general history of irrigation in the Ṣan'ā' basin. If our field data are incomplete so also is our search for data to be obtained from literary sources, but the extracts drawn from certain chronicles which follow do shed light on the discovery and exploitation of sources of underground water.

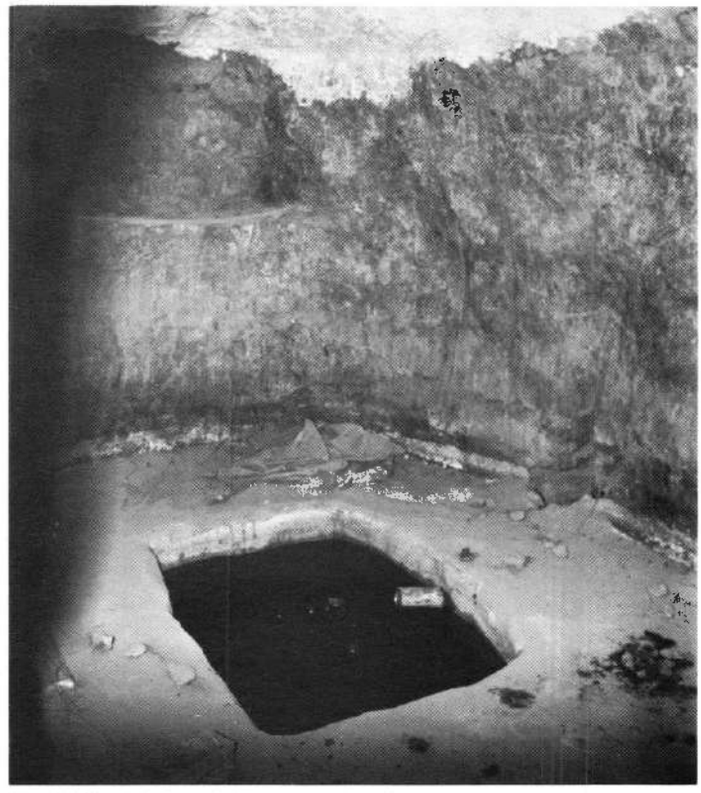
The author of *Ṭabaq al-ḥalwā*[57] informs us under the events of 1058/1648 that

> in this year an increase of the flow (*wārid*) of Ālāf in the (subterranean) water (*al-baḥr*) came about, the effect of which showed in Ṣan'ā' and its environs like al-Rawḍah and al-Jirāf. The *ghayl* of al-Jirāf showed at the lightest digging, and flowed from the top of the dam/barrage (*al-sadd*) at Shu'ūb/Sha'ūb, and it continued to do so. The people of al-Jirāf derived the most perfect advantage from it, and through the rising/discovery of bubbling springs (*istiṭlā' al-'uyūn al-fawwārāt*) people found relief from water-lifting from wells (*masānī*) and the labour on bucket-watered land (*dawālī*) or on *khaṭṭārahs*.[58] It is ancient foundations (*asās*), and a great abundant river (*nahr*) which the Ṭāhirid ruler (*dawlah*) buried over when he buried the *ghayls* of Ṣan'ā'. There followed this, in succession, the digging out (*istinbāṭ*) of another *ghayl* belonging to 'Alī the Imām's son which he brought forth by the least amount of labour, leading it to Manāẓir[59] al-Ḥushayshiyyah so that he irrigated them in entirety. It flowed to al-Rawḍah al-Ghannā' (the abounding in herbs and the hum of birds, insects etc.) and ran over into the gardens of that place.

Al-Jarmūzī[60] has a good deal more to say about the development of the *ghayls* at this time during the reign of al-Mutawakkil



2.4 Al-Ghayl al-Aswad. An ablution pool in one of the caves carved out alongside the *ghayl*.



2.5 Al-Ghayl al-Aswad. The second ablution pool.

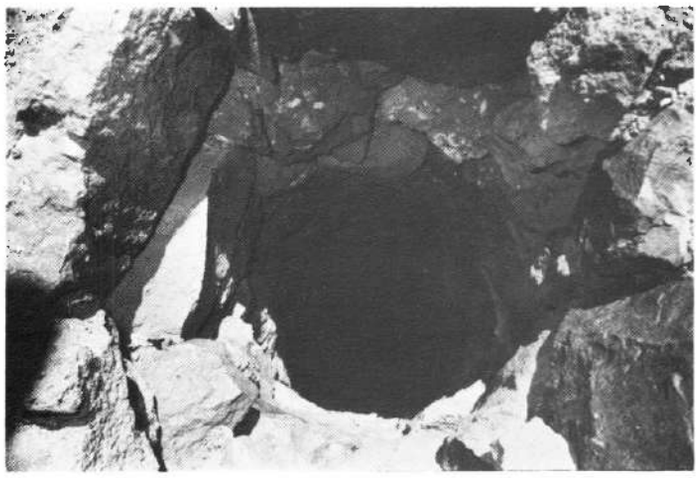
56 *Masājid Ṣan'ā'*, 50.

57 Op. cit., 22 b.

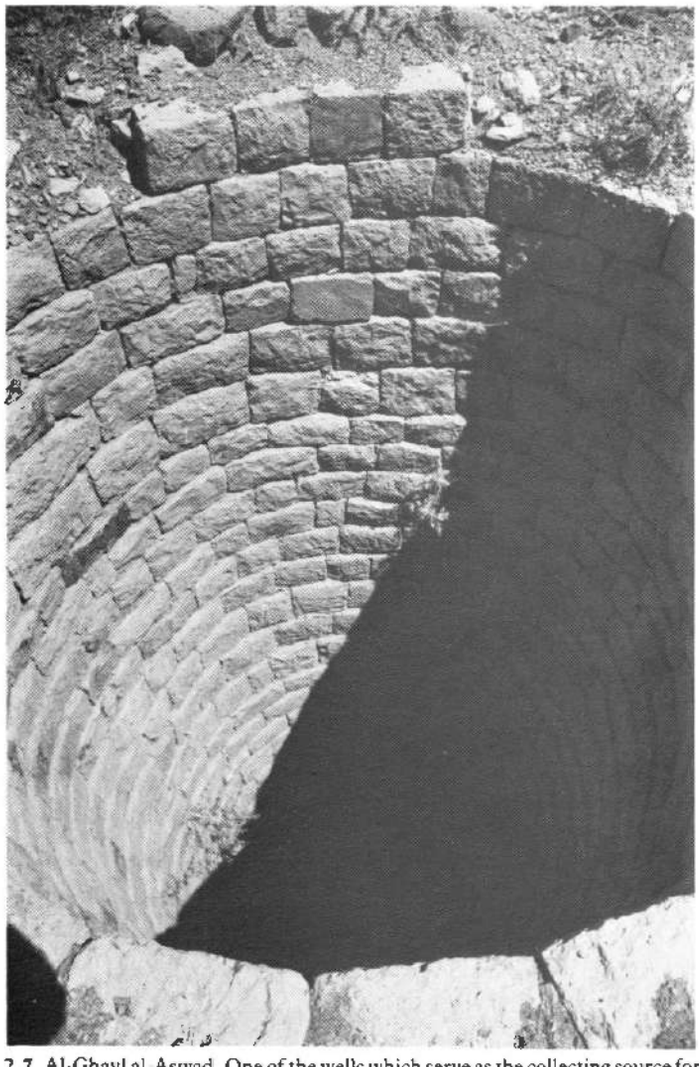
58 For the *'uyūn anhār* of al-Jirāfī cf. *A'immat al-Yaman*, (2), II, 170. For *dawālī* and *khaṭṭārāt* (the latter a simple and widely known apparatus for lifting water to be found, e.g., in Nigeria, Egypt and Hungary, consisting of a long pole set on an axle upon a column horizontally, and having a weight at one end and a scoop or bucket at the other - the bucket end dips into the water and is lifted by the weight at the other end) see C. van Arendonk, *Les débuts de l' imamat Zaidite au Yémen*, trans. Jacques Ryckmans, Leyde, 1960, 137 and 143. I have not yet seen or heard of the *khaṭṭārah* as being used in the Yemen today.

59 The reading is uncertain as this word is undotted.

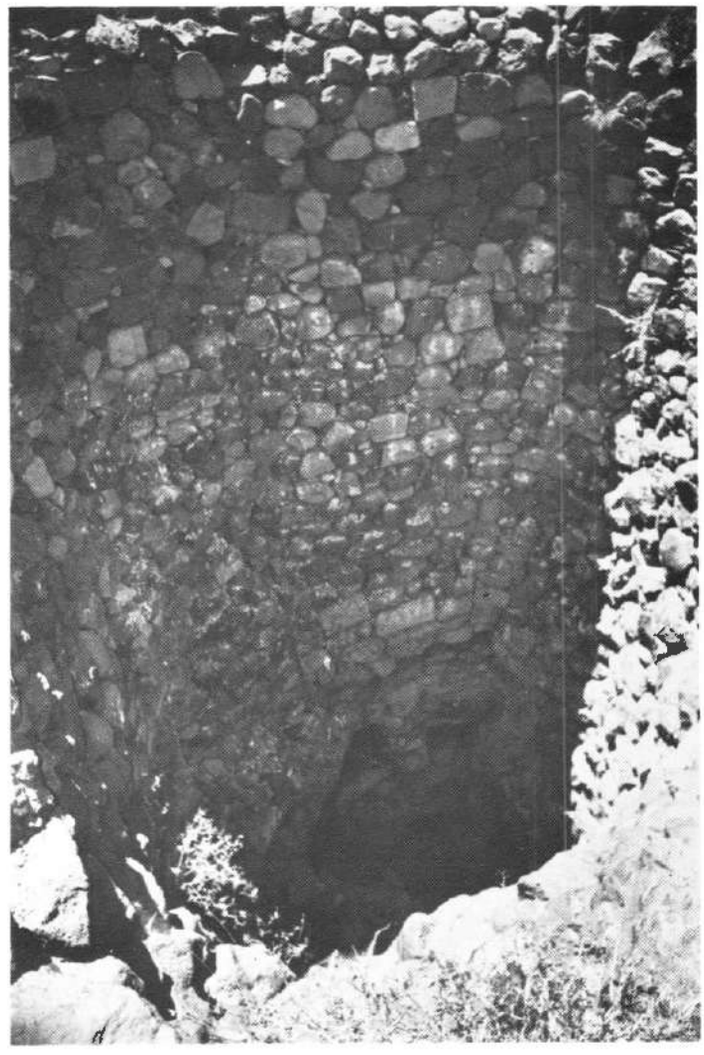
60 *Al-Sīrat al-Mutawakkiliyyah*, 557 seq.



**2.6** Al-Ghayl al-Aswad. A vent and access shaft.



**2.7** Al-Ghayl al-Aswad. One of the wells which serve as the collecting source for the *ghayl*.



**2.8** Al-Ghayl al-Aswad. A second gathering well, with outlets to the connecting *ghayls* visible near the bottom.

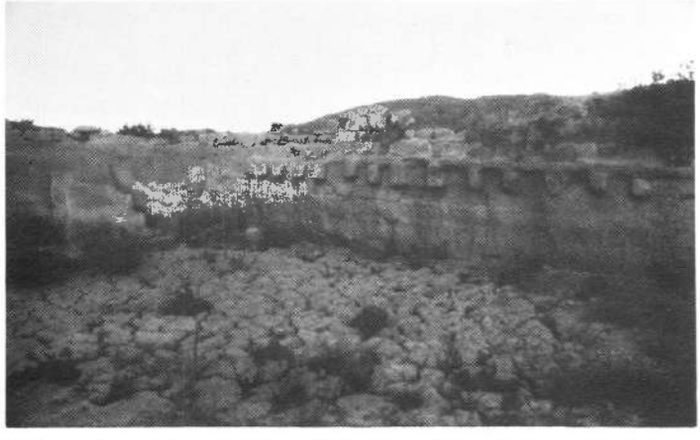
Ismā'īl (1054-87/1644-76), but regrettably the Mukallā Ms. is imperfect and worn at this passage. Of Ṣan'ā', he says,

> All its water is from wells except the *ghayl* of al-Rawḍah known as Ghayl Rislān.[61] Our lord al-Ḥasan, God be pleased with him, had excavated a *ghayl* near it which. . . (unclear). In digging it he ultimately reached to the length of the ropes of the wells nearby it, or more. In point of fact all he did was to produce water of a large well by (using) force-when the measuring of its depth (*qa'r*) was measured on the top of the ground, this being possible by artifice and patience. One of (our) predecessors brought forth Ghayl Ālāf near Artil, it being said that the person to do so was the Sayyid al-Imām al-Qāsim b. Aḥmad, buried in Dhamār, of the posterity of Zayd b. 'Alī, God's peace on him, he being a governor (*'āmil*) of the virtuous, the greatest Imām, al-Qāsim b. 'Alī al-'Iyānī (4th to early 5th/10th to 11th centuries), God's peace on him. Nothing else was known in Ṣan'ā'.[62]
>
> As for these *ghayls* which God has brought into the open in such abundance this was not Man's action, but a person of Shu'ūb/Sha'ūb merely happened to come upon wetness in earth (*ṭīn*) close to the dam/barrage, known as Sadd al-Imām, so he went up to it and water showed there. When he noticed it increase he informed our Lord 'Izz al-Islām, God succour him, who went out to it and ordered an extension (*tawsī'ah*) to be dug in it, and it increased until it was as I shall relate, if God Exalted will. It began to be brought forth after . . . (blanks in text) . . . and he appointed over it honest men (*umanā'*) (to oversee) the digging and construction of it. Then he built it with stone (text unclear) after setting long shafts (*kaẓā'im*) in it, and they were, up to the recording of this decision (? *raqm hādha 'l-tawqī'*), ...(blank)...each shaft (*kaẓīmah*) near to the building of a well (? in shape ?). He assigned places for them to cross to the paths, places for the washermen (*ṣabbānūn*), any who wanted to draw water (*ightirāf*), and for the Prayer. It irrigated their properties for most of the inhabitants of Shu'ūb from al-Jirāf then al-Rawḍah and al-Ḥushayshiyyah, increasing abundantly all the time. He brought it forth to the districts of Dhahbān and the homelands

61 Between the Military College and the road.

62 This statement is strange in view of the existence of al-Barmakī.

**2.9** Al-Ghayl al-Aswad. The mounds of material cleared from the shafts visible as the *ghayl* approaches Ṣan'ā' from the south.



**2.10** Al-Ghayl al-Aswad. The collecting cistern from which the *ghayl* begins.

of Jadir and 'Alamān, God revivifying through him a world of people and livestock. The supplies of our Lord Muḥammad bore the provisions and maintenance (*al-aqwāt wa-'l-nafaqāt*) necessary for any upon whom he relied, then the fodder for his horse and all. . .[63] (damaged) and he supplied many others apart from them. All these ways to the water had initially no track/trace/mark (*athar*)—God is most knowing.

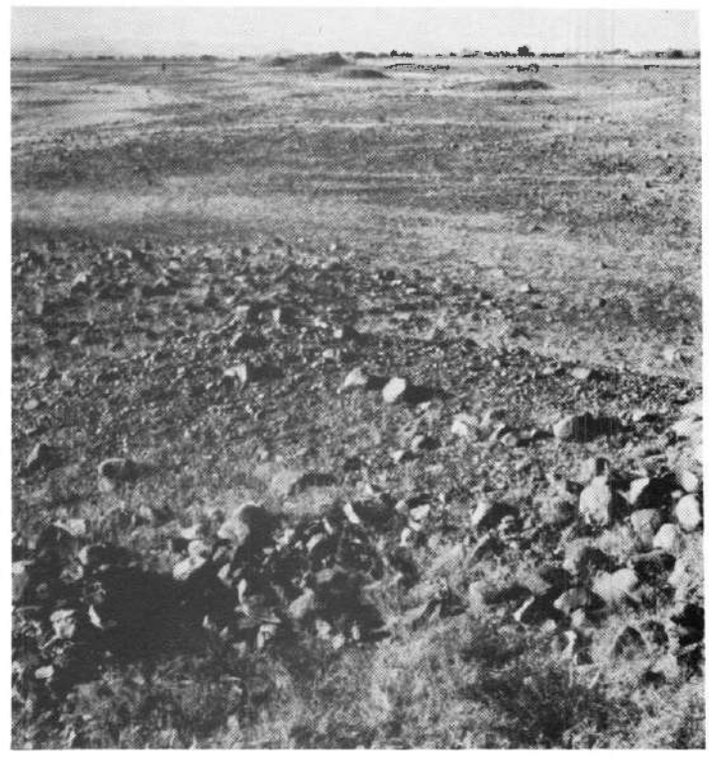
Yea, and one of the Shu'ūb people found an indication of water in another place near that, as already stated above, and he apprized our lord 'Alī, son of the Commander of the Faithful, God succour him, of that. So he also ordered people to dig and they discovered marks that had become lost under the ground and paths to the water, and the water became plentiful till it was near the river which belongs to our lord 'Izz al-Islām, God succour him, (in quantity), and it irrigated much of the districts of al-Rawḍah and what lies beyond them. Then our lord Aḥmad b. al-Ḥasan, God succour him, also discovered (water) and a great river (*nahr*), over and above the first two, came forth the flow of which he directed to many of the peasants (*ḍu'afā'*)[64] and many found advantage in it. Then our lord Muḥammad b. Aḥmad son of the Commander of the Faithful also discovered a river (*nahr*) but lesser than those previously mentioned. The country around these rivers was most fertile, its harvests (*khayrāt*) abundant, so these areas of it were brought into cultivation again.

Al-Jarmūzī continues,

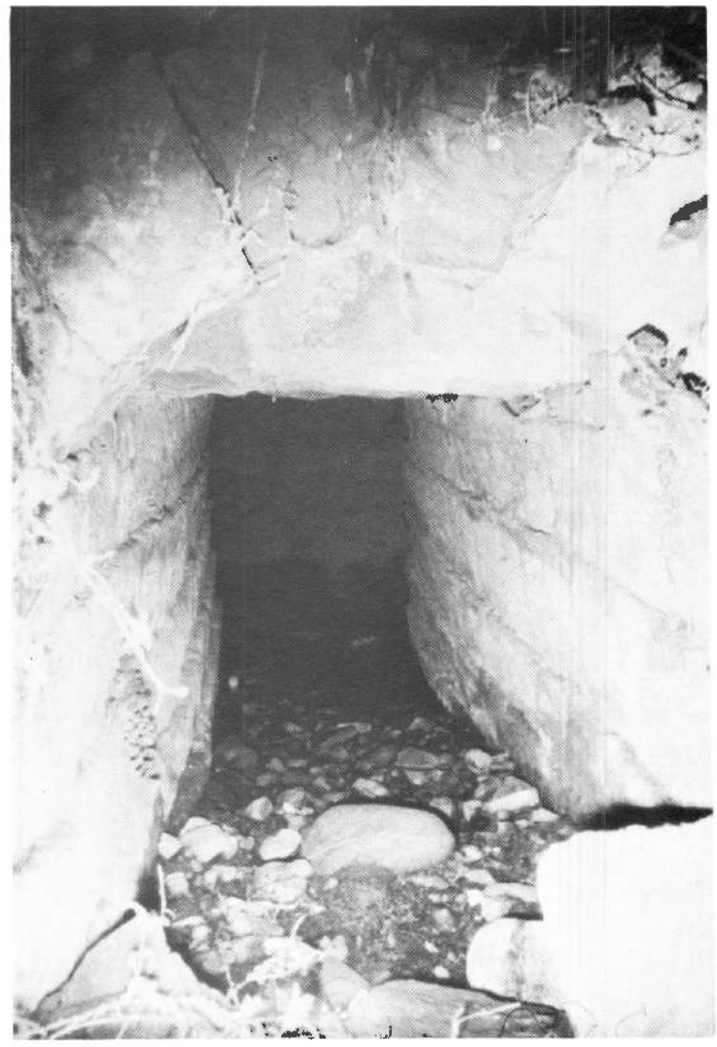
The increase in the (supply) of water goes on up till the present, increasing each year and the number of the said

63 The whole of this sentence is rather strange in the Arabic.

64 *Ḍa'īf*, presumably non-tribal cultivators.



**2.11** Al-Ghayl al-Aswad. A view along the line of the *ghayl*, with a shaft in the foreground.



**2.12** Ghayl al-Barmakī. An old section of the underground channel showing the 2nd/8th century construction, with stepped stonework of the same type as that of the wall of the Great Mosque.

> rivers on the Shu'ūb side now comes to six. Yea, and when our lord the Commander of the Faithful arrived in Preserved Ṣan'ā' in the year (10)71/1660-1, as will be related if God Exalted will, some person also discovered one, and he excavated, by the order of the Commander of the Faithful, peace upon him, a great river (*nahr*), apart from those already mentioned.

Round about a quarter of a century later or much less these *ghayls* were to suffer much damage, for in Jumādā I 1083/late August 1672 'a copious rain fell at Jabal Artil and Bayt Baws south of Ṣan'ā', and the floods collected at its Khandaq (the southern (?) arched wall) and most of the *ghayls* were destroyed, especially Ghayl al-Imām, and that had been going on for days.'[65] Then again in 1089/1678 'halfway through Ṣafar/April the great flood came down from Nuqum and buried the *ghayl*, Ghayl al-Rawḍah which issues forth from al-Ṣafā,[66] and other *ghayls*, and destroyed a number of houses of Shu'ūb and other places.'

## Ghayl al-Mahdī and Ghayl Muṣṭafā

Ghayl al-Mahdī is that mentioned by al-Jarmūzī[67] as founded by Aḥmad b. al-Ḥasan (1087-92/1676-81), irrigating al-Rawḍah. According to *al-Badr al-muzīl*,[68] 'the Imām brought it forth and he made it a *waqf*, he having a right to it for the estates (*istiḥqāq-an la-hu 'ala 'l-ḍiyā'*). Then it became cut off. Its source (*manba'*) is from the middle of Shu'ūb. Later the Governor (Wālī) Muḥammad 'Izzat, in the year 1302/1884-5, brought it out and repaired its channels up to al-Rawḍah, spending much money on it. Then the shaykh 'Alī al-Bilaylī purchased it from him.'[69] In 1309/1891-2 a flood from Sa'wān came down which destroyed al-Rawḍah and created much damage in it, even to the dam (*sadd*) of Ghayl al-Mahdī and destroyed the water channels (*sawāqī*). Ghayl Muṣṭafā has its source higher up than Ghayl al-Mahdī, near Ṣan'ā'. It takes its name from a certain 'Alī Muṣṭafā, of Damascan descent but of Meccan origin (ob. 1196/1782) who bought it and made it descend into al-Rawḍah. *Al-Badr al-muzīl*[70] affirms that it flows into Ghayl al-Mahdī. It was cut off for a period, then, during his governorship, Aḥmad Fayzī/Fayḍī, in the year 1310/1892-3 brought it forth and repaired it, after which the shaykh Muḥammad al-Bilaylī bought it also, from him. Nazīh al-Mu'ayyad[71] comments that, going out of al-Rawḍah, one passes first by Ghayl al-Mahdī, and Ghayl Muṣṭafā, running two to three metres under the ground like 'Roman *qanāts* for water with us in Syria.'

A first inspection of the northern *ghayls* gave us the names Ghayl al-Manṣūr and Ghayl al-Mahdī. The latter actually flows into the former to form one big channel flowing in a straight line to al-Rawḍah. In more recent times it seems that at the head of both channels, were dug deeper and large wells, most probably in order to reach down to the water-table and increase the amount of water supplied to the channels.

Already under Imām Yaḥyā, at the large well of Ghayl al-Manṣūr a water pump was installed, then it was improved and restored several times, until, some twenty years ago, the well ultimately dried up. The situation became even worse with the construction of the Textile Factory which started to discharge polluted water towards the catchment area of the channels. Today the site is a filthy place with stagnant black water and dying vegetation.

When the channel reached al-Rawḍah it split into two main branches, one carrying on towards the middle of the town, and one flowing to the very end of it, on its eastern side.

## Ghayl Abī Ṭālib

This *ghayl* is described as irrigating up to al-Rawḍah, its source being east of Shu'ūb below the village of al-Ḥāfah. 'Ṭughtakīn b. Ayyūb brought it forth. When the rule (*dawlah*) and Caliphate passed to the Imām al-Manṣūr billāh al-Qāsim b. Muḥammad (1006-29/1598-1620) he assigned it to his son Abū Ṭālib Aḥmad b. al-Qāsim, and he made it a *waqf* to the estates in Darb al-Salāṭīn in al-Rawḍah, al-Ḥillah, Bīr Zayd, and some for the Jāmi' Mosque of al-Rawḍah. This *ghayl* still continues (to flow) up to now (1926) but it is sometimes strong, sometimes weak.'[72]

Zabārah states[73] that he has seen a writing (*muḥarrar*) of 'Alī Muṣṭafā dated 1196/1782, the contents of which pose something of a problem to us here. In this, 'Alī Muṣṭafā notes

> that he bought half of the Ghayl al-Ḥusayn b. al-Mu'ayyad called Ghayl al-Sadd, the well known *ghayl* north (*qiblī*) of the city of Ṣan'ā' from its owners (*mullāk*), the Bayt Abī Ṭālib, its *qarār* (place where water rests, probably the source or perhaps the dam itself), its possessed water-courses (*majārī mamlūkah*) along with the rights ensuant to them in *shar'*-law and *'urf*-custom, and that, after repairing it and bringing it forth, he constituted it a *waqf muḥabbas*[74] firstly for himself, then for his children and their male and female children. . . . If his posterity from the Yemen, al-Ḥaramayn and Damascus become extinct the revenues of the *waqf* (*ghallāt al-mawqūf*) are to be applied in the interests (*li-maṣāliḥ*) of the Jāmi' Kabīr in Ṣan'ā' of the Yemen. He assigned the guardianship (*walāyah*) over it to himself so long as he lives, then to the upright of his children. If they become extinct and it goes to the Jāmi' Mosque the guardianship will go to the Imām al-Miḥrāb (i.e. the Imām al-Ṣalāḥ) in the Jāmi'.

It was Ghayl al-Sadd which was, as al-Jarmūzī has informed us, developed by 'Izz al-Islām about the middle of the 11th/17th century, but the name Ghayl al-Ḥusayn b. al-Mu'ayyad suggests the Imām al-Manṣūr . . . al-Ḥusayn b. al-Qāsim b. al-Mu'ayyad (1127-31/1716-20), and this in turn suggests that the name Ghayl al-Manṣūr, into which today Ghayl al-Mahdī flows, is another appellation for the same *ghayl*. On the other hand the Abū Ṭālib house is not stated to have owned this *ghayl*, but only the *ghayl* called after its house. For the moment therefore it is uncertain to which *ghayl* this passage refers.

## The Old Ṣan'ā'-al-Rawḍah Road

Only those parts of this old road which, since they were exposed to the action of floods, had to be built or paved, are still clearly visible today. As the road must bear some relationship in its siting to the *ghayls* it is relevant to describe its course in case it undergoes alteration in coming developments.

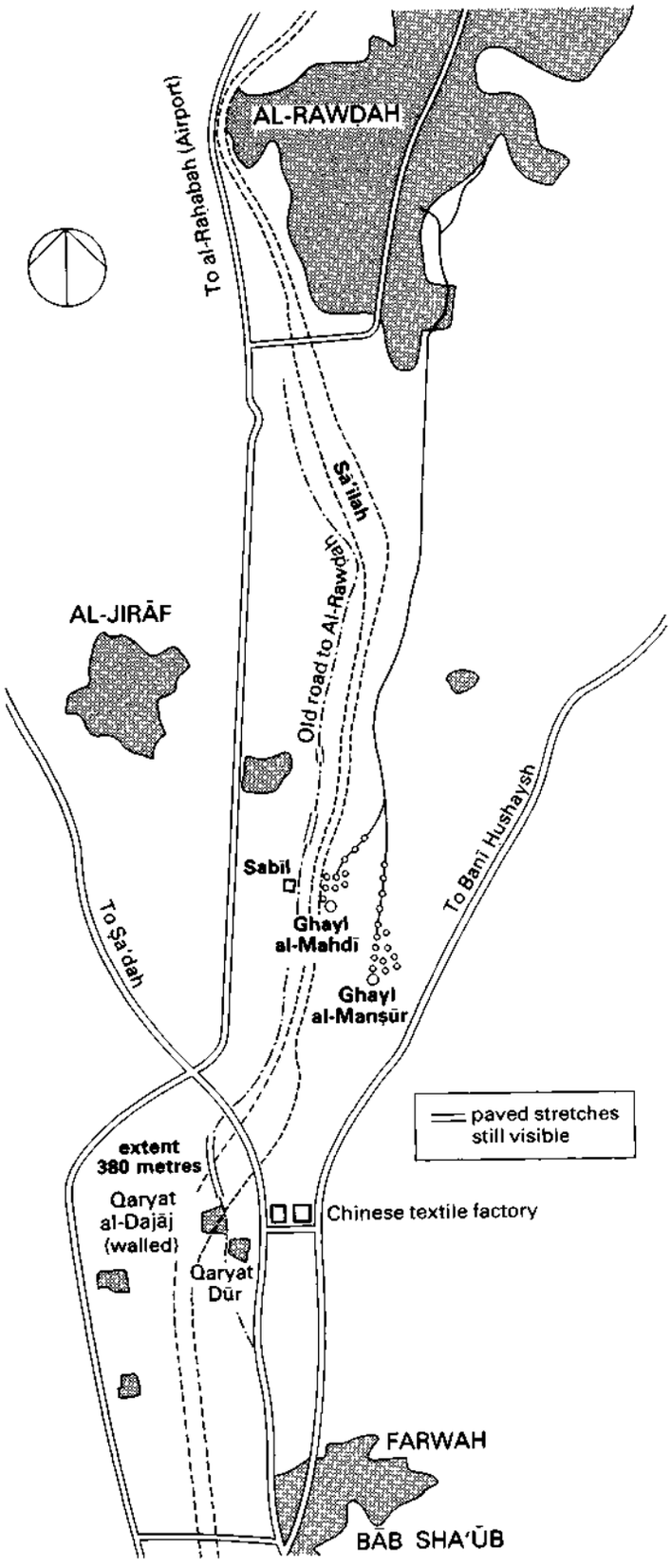
The road started at Bāb Sha'ūb/Shu'ūb following the same route as the modern one for about 800m, then it turned gently towards the Sā'ilah bed and along its eastern bank. The road touches a small group of old houses around a very old well—old rustic dressed stones are re-used in the walls of these houses—then goes on to Qaryat Dūr and Qaryat al-Dajāj. Immediately after the last named village is preserved quite a long stretch of paved road and a small bridge, the width of the inner span being 2.65m

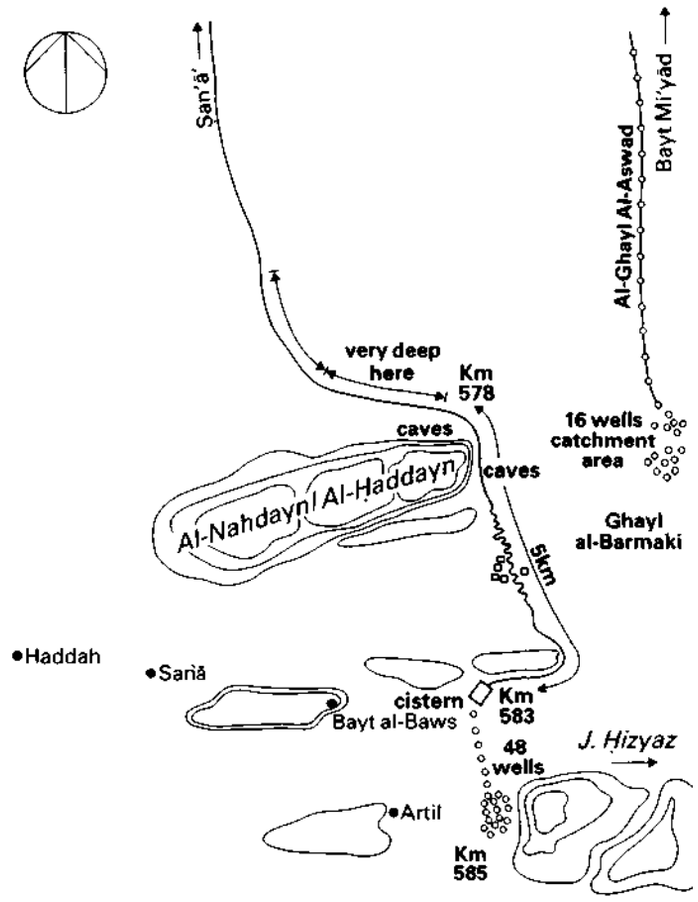
65 *Ṭabaq al-ḥalwā*, 95a.
66 Ibid, 120 b. Al-Ṣafā seems unknown to the maps.
67 Cf. p.82a-b.
68 Of 'Abd al-Wāsi'...al-Wāsi'ī, 11.
69 Ibid, *Ta'rikh al-Yaman*, 1st ed., 1356 H, 147.
70 Ibid, 11; *Nashr al-'arf*, II, 303.
71 Nazīh al-Mu'ayyad al-'Aẓm, *Riḥlah*, I, Cairo, 1937(?), 260.
73 *Nashr al-'arf*, II, 303.
74 A *waqf*, lit. an inalienable *waqf*, but perhaps there is some special distinction in Zaydī law.

and the inner height to the key 1.40m. The arch is today formed by two courses of stone of a thickness of 0.42m; the width of the bridge from face to face is 3.90m. The built and paved road is preserved for a length of 380m, its width being from 3.50 to 5.30m.

Two other small portions of the paved road are preserved near the village of al-Jirāf. It would be interesting to make a topographic survey with cross-sections, of the area near al-Jirāf where the Sā'ilah, road and channel run parallel and very close to one another. In all probability the road may have been built and paved with huge stones only where it was necessary to do this, so those parts visible are likely to be also the only sections so constructed existing in olden days.

The date of this road is so far unknown. It seems at least several hundred years old, while the bridge was probably re-built in more recent times.




*Ghayls* to the north (left) and south of Ṣan'ā'.